The Science Assessment

The 2009 NAEP assessment in science for grade 4 contains multiple-choice questions, as well as short and extended constructed-response exercises. At least 50% of the assessment time is devoted to constructed-response exercises. These questions measure students' knowledge of facts, ability to integrate this knowledge into larger constructs, and capacity to use the tools, procedures, and reasoning processes of science to develop an increased understanding of the natural world.

The 2009 Science Framework replaces a framework developed in 1996. The 2009 NAEP science assessment is organized according to science content and practices.

Science Content

Physical Science	Life Science	Earth and Space Science
Matter • Properties of Matter • Changes in Matter **Energy** • Forms of Energy • Energy Transfer • Conservation **Motion** • Motion at the Macroscopic Level • Forces Affecting Motion	**Structures and Functions of Living Systems** • Organization and Development • Matter and Energy Transformations • Interdependence **Changes in Living Systems** • Heredity and Reproduction • Evolution and Diversity	**Earth in Space and Time** • Objects in the Universe • History of the Earth **Earth Structures** • Properties of Earth Materials • Tectonics **Earth Systems** • Energy in Earth Systems • Climate and Weather • Biogeochemical Cycles

Science Practices

The frameworks reflect these four science practices:

- Identifying Science Principles
- Using Science Principles
- Using Scientific Inquiry
- Using Technological Design

The greatest emphasis is on Identifying and Using Science Principles.

Science Booklet Directions

In each of sections 1 and 2, you will have 25 minutes to answer a series of questions about science.

You will be asked to respond to several different types of questions. Some of the questions will require you to choose the best answer and fill in the oval for that answer in your booklet. On questions like this, be sure to mark your answers clearly and darken the oval completely. If you make a mistake or want to change your answer, be sure to erase any unwanted marks. Here is an example of a question that requires you to fill in an oval.

Example 1

How hot is it on the surface of the Sun?

Ⓐ Not quite as hot as boiling water

Ⓑ About as hot as fire

Ⓒ About 100°F`

● Much hotter than almost anything on Earth

For some questions, you will be asked to write short answers on the blank lines provided in your booklet. Here is an example of a question that requires you to provide a short answer.

Example 2

Describe one important difference between plants and animals.

Most plants make their own food, while animals eat plants and other animals for food.

Also, you will be asked to answer some questions by writing longer, more detailed responses. For example, here is a question that requires you to provide a longer answer.

Example 3

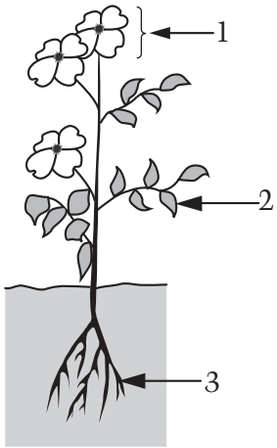
Describe three things that animals do to survive in areas that have cold winters.

Some animals store a lot of fat so that they can go into a deep sleep all winter. Some animals grow a thick coat of fur to keep them warm. Some birds and butterflies fly away from a cold area and spend the winter in a place that is warm and has a lot of food.

When you are asked to write your response be sure that your handwriting is clear. Think carefully about each question and make your answers as complete as possible, using as many lines as you need. If you finish a section before time is called, you may go back and check your work on that section only.

Finally, in some questions you may be asked to draw a diagram or fill in a table.

Sample Science Questions
Grade 4



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1. Name the parts of the plant above that are labeled 1, 2, and 3. Explain the function of each part.

	Name of Part	Function
1.		
2.		
3.		

HE001462

2. On steep slopes along the sides of new roads, highway department workers often grow plants to prevent the soil from being eroded. Describe two ways that these plants keep the soil from eroding.

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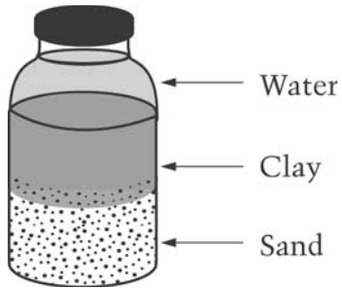

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3. A student put some sand, clay, and water into a bottle and shook the bottle. Then he put the bottle down.

   After two hours, the bottle looked like the drawing above. What can the student conclude based on what he sees in the bottle?

   Ⓐ The water is heavier than the grains of clay and the grains of sand.

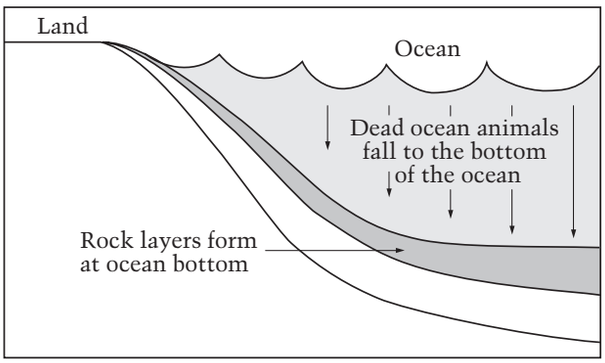
   Ⓑ The grains of clay are heavier than the grains of sand and the water

   ● The grains of sand are heavier than the water and the grains of clay

   Ⓓ The water, grains of clay, and grains of sand are all of equal weight.

HE001463

4. The picture below shows how a type of rock forms at the bottom of the ocean. What type of rock is this?



   Ⓐ Lava

   Ⓑ Igneous

   ● Sedimentary

   Ⓓ Metamorphic

STOP